

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the foregoing amendments and the following remarks.

Claim Status

Claims 2 and 9 have been canceled. Claims 1, 7, 8, 14, and 19-22 are currently amended. Accordingly, claims 1, 3-8, and 10-22 are pending in this application.

Claims 1, 7, 8, 14 and 19-22 have been amended to add the elements that "said first end cap being attached exclusively to said first end of said shell" and that "said second end cap being attached exclusively to said second end of said shell." Support for these amendments is shown on Page 5, Line 21 through Page 6, Line 5 of the Specification and in Figure 1, where end caps (26) and (28) are attached exclusively to the ends (21) and (23) respectively of shell (24). Thus, no new matter has been added, and the amendments to claims 1, 7, 8, 14 and 19-22 should be allowed.

§103 Rejection

Claims 1, 3-8 and 10-18 are rejected as being obvious over Cho (US 6,616,841) in view of Kuzumoto (US 4,623,460), and alternatively over Kuzumoto in view of Cho. Applicant respectfully

disagrees because neither Cho nor Kuzumoto teach or suggest all the limitations of the currently amended claims.

The MPEP, § 2143, states that:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations.

Regarding the third criterion, the court has stated that "to establish *prima facie* obviousness of a claimed invention, **all** the claim limitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Independent claims 1, 7, 8, 14, and 19-22, as currently amended, recite a membrane contactor/system comprising, among other things, where "said first end cap being attached **exclusively** to said first end of said shell" and where "said second end cap being attached **exclusively** to said second end of said shell." This configuration of a membrane contactor is nonobvious because neither Cho nor Kuzumoto teach or suggest a membrane contactor where both the first and second end caps are attached **exclusively** to their respective ends of the shell.

Cho shows a membrane contactor where both end caps (15) are attached to the core tube (12). See Figures 1 and 3-4. The necessity of the attachment of the end caps (15) to the core tube (12) is embodied by head spaces (28), which are formed between end caps (15) and tube sheets (26). Head spaces (28) allow a vacuum drawn at ports (32) and (34) to be "in communication with the lumen side of hollow fibers 16." See Column 3, Lines 1-7 and Figures 1 and 3-4. Referring specifically to Figure 4, "[v]acuum 30 is in communication with headspace 28 which, in turn, is in communication with the lumens of hollow fibers 16." See Column 4, Lines 46-50. Accordingly, in order to create the necessary vacuum in head space (28), end cap (15) must be attached and sealed to the core tube (12). Thus, Cho can not teach or suggest having both the first and second end caps attached **exclusively** to the respective ends of the shell.

Kuzumoto shows a fluid separation element where one of the end caps is attached to the inlet pipe (7). See Figure 1. In Kuzumoto, "[t]he fluid to be treated comes from an inlet pipe 7 into the element and flows through the pipe 8. Then, the fluid comes out through the holes at the wall of the pipe 8, enters into the bundle, flows through the inner compartment 4 and is discharged from an outlet pipe 9." See Column 1, Lines 49-59 and Figure 1.

Accordingly, in order to force the fluid to flow through the hollow fiber membranes and not just through inlet pipe (7) and out of outlet pipe (9), the end cap must be attached and sealed to inlet pipe (7). Thus, Kuzumoto can not teach or suggest having both the first and second end caps attached **exclusively** to the respective ends of the shell.

Furthermore, Applicant previously submitted a 132 Declaration by one of the named inventors, Amitava Sengupta, as secondary indicia of nonobviousness. The Sengupta Declaration shows that the instant configuration of a membrane contactor allowed the membrane contactor to be made without the need to simultaneously dual weld the end caps to the center tube and shell, meaning, the end caps can be attached and sealed **exclusively** to the ends of the shell.

Objective evidence, or secondary considerations of obviousness, like an unexpected result or a long felt need, must be weighed in determining obviousness. MPEP § 2141. In addition, the ultimate determination on patentability is made on the entire record, meaning, the secondary considerations of obviousness should be considered in view of any amendments. MPEP § 2141. Thus, in the instant invention, the Sengupta Declaration must be weighed against the current amendments in making a final determination of obviousness.

The instant configuration of a membrane contactor, as discussed in the Sengupta Declaration, where the end caps are attached **exclusively** to the ends of the shell, unexpectedly resulted in allowing the membrane contactor to be made more easily because it unexpectedly eliminated the need to dual weld the end cap to the shell and center tube. Furthermore, welding the end cap to the shell is very difficult (see Sengupta Declaration, Paragraph 14). This difficult step was previously done by simultaneously welding the end cap to the shell and the end cap to the center tube (see Sengupta Declaration, Paragraphs 7-12 and 14). Thus, the instant invention also satisfied a long felt need of providing a membrane contactor that did not have to be dual welded. Therefore, eliminating the dual welding step to a single weld of the shell to the end cap, i.e., attaching the end caps **exclusively** to the ends of the shell, allows a membrane contactor to be made more easily, which is an unexpected result and satisfies a long felt need. Thus, the instant configuration of a membrane contactor is nonobvious.

In sum, Cho nor Kuzumoto teach or suggest making a membrane contactor with the configuration of the instant application, i.e., where both the end caps are attached **exclusively** to the respective ends of the shell. Furthermore, this configuration of a membrane contactor is nonobvious because it produced an unexpected result and satisfied a long felt need.

Accordingly, this rejection must be removed and claims 1, 3-8 and 10-22 should be allowed.

Conclusion

In view of the foregoing, Applicant respectfully requests an early Notice of Allowance in this application.

Respectfully submitted,



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